

MA 113 OLYMPIC SITE SELECTION PROBLEM

On September 23, 1993, 88 members of the International Olympics Committee (IOC) met in Monte Carlo to choose a site for the 2000 Summer Olympics. Five Cities made bids: Beijing (China), Berlin (Germany), Istanbul (Turkey), Manchester (England) & Sydney (Australia). Below is a summary of the site preferences of the committee members.

	NUMBER OF VOTES								
CHOICE	3	2	32	3	3	1	8	30	6
1 st Choice	Ist	Ist	Bei	Man	Ber	Ist	Man	Syd	Ber
2 nd Choice	Bei	Bei	Ist	Bei	Bei	Syd	Syd	Man	Syd
3 rd Choice	Man	Ber	Ber	Ber	Ist	Bei	Ber	Ber	Man
4 th Choice	Ber	Man	Man	Syd	Syd	Man	Ist	Ist	Bei
5 th Choice	Syd	Syd	Syd	Ist	Man	Ber	Bei	Bei	Ist

Examine the table above carefully, then answer the following questions based on the information in the table.

1. Does any city have a majority of the first choice votes? (If so, which city?)
2. Does any city have a majority of the last choice votes? (If so, which city?)
3. Which city has the most first choice votes? (How many does it have?)
4. Which city has the fewest first choice votes? (How many does it have?)
5. Which city has the most last choice votes? (How many does it have?)
6. Which city has the fewest last choice votes? (How many does it have?)
7. Which city has the most first and second choice votes combined? (How many does it have?)
8. Which city has the fewest first and second choice votes combined? (How many does it have?)
9. Which city has the most fourth and fifth choice votes combined? (How many does it have?)
10. Which city has the fewest fourth and fifth choice votes combined? (How many does it have?)
11. Which city is selected if the committee decides to use the Plurality Method?
12. Which city is selected if the committee decides to use the Plurality with Elimination Method?
13. What if the committee decides to give 5 points to each city for every first place selection it gets, 4 points for every second place selection, 3 points for every third place selection, 2 points for every fourth place selection, 1 point for every fifth place selection—the winning city will be the city with the most points. Which city will be selected?
14. Which city is selected if the committee decides to use the Borda Count Method?
HINT: This is an easy one if you've done #13 since Borda Count is the name of the method described in #13.

15. Which city is selected if the committee decides to use the Pairwise Comparisons Method?
16. Rank the cities from first to last using Extended Plurality. (Remember, you found the Plurality winner in #11.)
17. Rank the cities from first to last using Extended Plurality with Elimination. (Remember, you found the Plurality with Elimination winner in #12.)
18. Rank the cities from first to last using Extended Borda Count. (Remember, you found the Borda Count winner in #14.)
19. Rank the cities from first to last using Extended Pairwise Comparisons. (Remember, you found the Pairwise Comparisons winner in #15.)
20. Rank the cities from first to last using Recursive Plurality.
21. Rank the cities from first to last using Recursive Plurality with Elimination.
22. Rank the cities from first to last using Recursive Borda Count.
23. Rank the cities from first to last using Recursive Pairwise Comparisons.
24. Which city is selected if the committee decides to use Approval Voting? (Assume that each voter approves only of his/her first two choices.)
25. Rank the cities from first to last under Approval Voting.